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Isidor KITSEE Electricity vs Tree Pests

Scientific American (27 May 1916), p. 549

Electricity as a Tree Pest Cure

Patent papers recently granted to Isadore [Isidor] Kitsee, a Philadelphia inventor, covering a process for the destruction of insect and germ life harmful to plants and trees, the electrical method taking place, to a great extent, of the usual sprays and other applications. The process consists of making an application of a solution such as saline water where the ground is to be treated, and then causing a current of electricity to be passed through the soil, whereupon the gas generated will rid the soil of germs, larvae, and insects without the least injury to the vegetation. Where a larger area is to be treated, it has been found desirable to dig shallow trenches at opposite ends of the area to be treated, and the electric terminals are placed in these. An application of somewhat more powerful current will rid the entire area of pests. When the plant itself is to be treated, the solution carrying the element is made the electrolyte in an apparatus, and the plant sprayed with a solution after decomposition has taken place through the action of the electric current.

US1172367
DESTROYING INSECTS HARMFUL TO PLANT LIFE

Fig. 1.

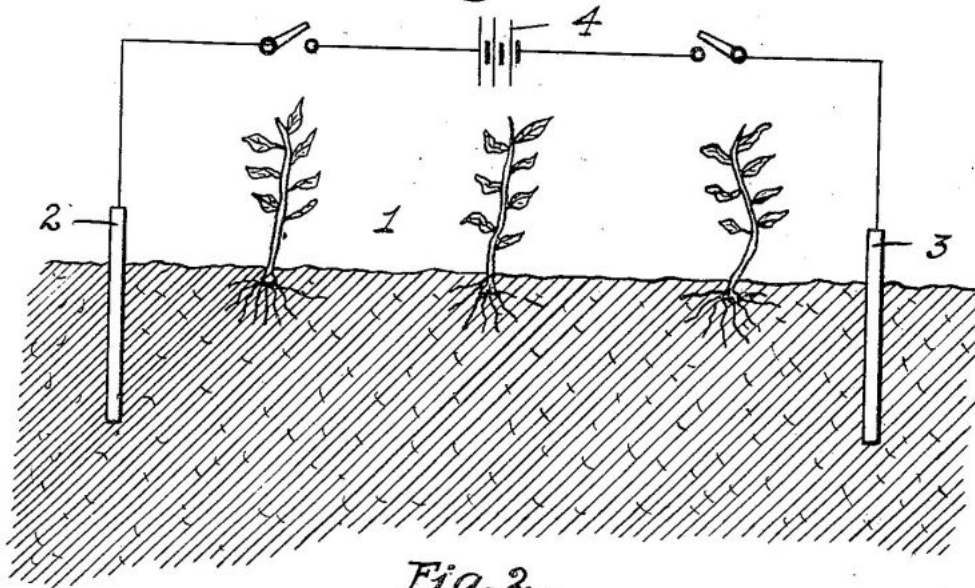
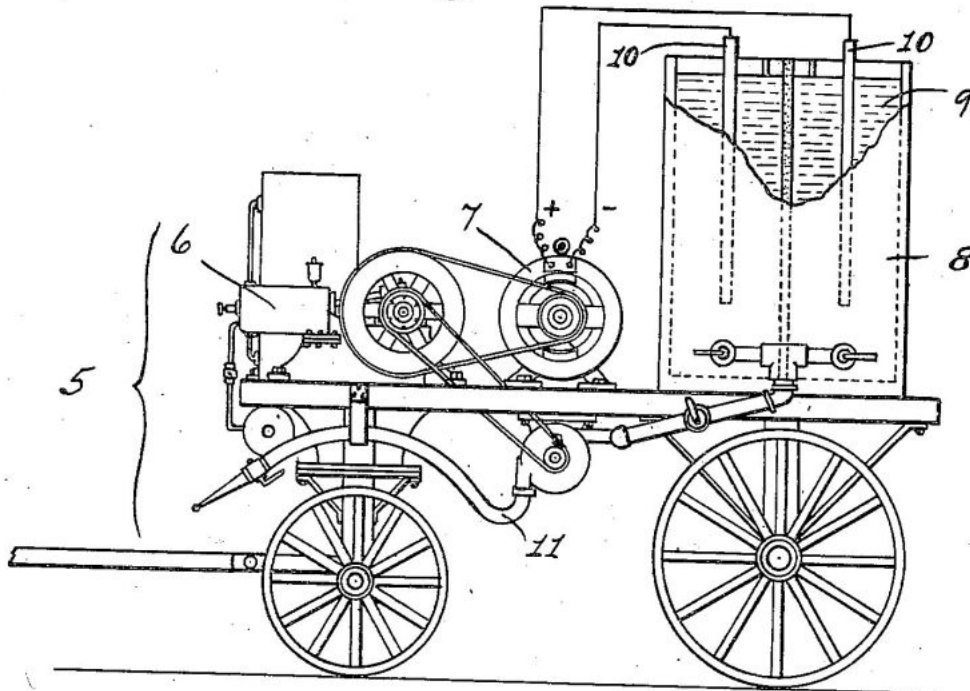


Fig. 2.



Inventor:
KITSEE ISIDOR

My invention relates to an improvement in destroying insects harmful to plant life. The method of destruction of such insects as carried out to-day may be divided into two large classes: (a) The destruction of insects with the aid of chemicals placed in the soil around the plant to be protected, as for instance, the treatment of grape vines with the aid of bisulfide of carbon poured into the holes made in the soil around the roots of the plant. (b) The spraying of the plant itself with the aid of an insecticide solution, such as arsenites, or the treatment of the plant with gases such as hydrocyanid. Each of these methods has its drawbacks.

It is the aim of my invention to eliminate the disadvantages of the systems of to-day and produce means whereby the obnoxious insect's as well as their larvae and eggs may be destroyed at a comparatively small cost and with comparative simple means.

The underlying principle of my invention consists in the generation of the insecticide, preferably in the form of a free gas or a gas dissolved in a solution with the aid of an electric current, and applying gas or gas containing solution in a nascent state to the soil or plant infested with the insects, their larvae or eggs.

My invention may be practiced either by freeing the soil from obnoxious insects or by freeing the plant from same, and I will give a few examples whereby a person versed in the art may practice my invention.

1. If it is required to purify a comparatively small area of the soil in which the plant grows, then the soil is impregnated with the solution carrying an insecticide element and this solution is then electrolyzed with the aid of an electric current by simply inserting electrodes around the area to be purified and connecting the electrodes to a current carrying circuit. If the area to be purified is comparatively large, then it is preferred that trenches be dug on at least two sides of the area and filled with the solution to be electrolyzed. It is also to be preferred if possible to impregnate the whole area with the solution. Large conductors are then placed in the trenches and connected to a current carrying circuit.

2. When the plant itself, such as a tree, in an orchard has to be treated, then the solution carrying the element adapted to destroy the insects is made the electrolyte in an electric apparatus and the plant then sprayed with the solution after decomposition has taken place through the action of the electric current.

A very simple and economic means of accomplishing this object is the following:- On a vehicle is placed a tank suitable to be converted into an electrolytic apparatus by filling the same with the required electrolyte and immersing therein two electrodes, an anode and a cathode. If preferred, the tank may be divided into two compartments.

The motive power of said vehicle, if self-driven, is coupled to a generator such as a dynamo and to the leads of the dynamo are connected the two electrodes. The vehicle is moved to the required tree, and if an truck is used, the dynamo is uncoupled when moving about and is then placed in action and currents of electricity are sent through the electrolytic apparatus thereby electrolyzing the solution and freeing the element adapted to destroy the insect either in the form of a gas or in the form of a gas bearing solution.

Different materials may be used for the purpose indicated and I will here only enumerate a few chemical compounds well adapted to electrolyzing and generating through electrolyzation the germicide gases:-common salt, chloride of sodium, (NaCl.) If salt is used, then through the electrolytic action chlorine is generated in the positive compartment or in the region of the positive electrode, and this chlorine, either in its gaseous state or dissolved in a liquid is one of the best insecticides not only for the spraying of the plant itself but also for the purpose of purifying the soil in which the root is growing.

In making use of the electrolyte either the contents of positive compartment alone may be used or the same may be mixed with the contents of the negative compartment which then contains a hydrated oxide of sodium.

Ammonium compounds are well adapted for the purpose in question as they not only act as an insecticide after electrolyzation but also enrich the soil and act substantially as a fertilizer. Of these compounds the cheap carbonate of ammonium, chloride of ammonium, nitrate of ammonium, as well as any of the sulfates may be used for the reason that the free ammonia, (NH₃) is a germicide in itself and yet will act, when combined with moisture of the soil, as an enricher of same. It was found that in selecting the compounds to be electrolyzed it is best to select such compounds as will

give in the negative compartment a strong alkaline reaction. It is impossible to give it strict rule as to the character and strength of the electrolyte when used as the nature of the plant, the nature of the soil, and the species of the insects has to be taken into consideration. In some cases where the nature of the plant or the nature of the seed does not allow the application of : an. alkaline solution, the; soil may be impregnated with salts of metals, such even as a salt of iron or copper, and the compound then electrolyzed. In all cases it is best to apply the electrolyzation either in the early spring or the late fall. Persons versed in the art, will readily find the exact time and exact compound necessary for each particular case. In a great many cases where the electrolysis is applied to the soil it is best to .apply thereto two separate operations and in the second operation the current should be reversed and the electrode formerly used as anode should be made the cathode and vice versa. This second operation may be made after the soil is again saturated with a fresh solution. This. second operation is necessary in some localities as otherwise a great part of the area treated would only receive the catholyte. With this my invention, if the same is carefully carried out, the most obnoxious insects, such as weevils in cotton fields, or scales on fruit trees, can be successfully destroyed. The only caution that is necessary is to so adjust the strength; of the electrolyte that the root of the plant shall not be injured if the insects are to be treated in the soil.

To illustrate some forms my invention may take I have recourse to the accompany. drawing,' in which : Figure 1 is a partial sectional and partial diagrammatic view and Fig. 2 is a partial side elevation and partial diagrammatic view embodying my invention in different forms.

In Fig. 1, the soil or ground is indicated . by the numeral L The soil is supposed to be impregnated with the solution containing the insecticide in chemical combination. 2 and 3 are the electrodes; 4 the source of electric current, here shown as a battery, connected with the interposition of switches to the electrodes.

In Fig. 2 the truck is indicated by the numeral 5, the motive power by 6, the generator of electricity or dynamo by 7, the electrolytic apparatus by 8, the electrolyte by 9; the electrodes by 10 and. the means to carry the electrolyte to the desired point by 11.

I may state here that the process as outlined for the soil is also very efficient for the destruction of the eggs or larvae of the mosquito or alike insects. In this case a quantity of salt is added to the pool wherein the eggs or larvae abound and then electric current is applied for the purpose of electrolyzing the salt, if such is used.



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